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Division of Mycology and Disease Survey

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XXII Number 22

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IN THIS ISSUE

A potato disease which has hitherto been reported under the name "bacterial wilt and tuber rot, of undetermined cause" now seems to be identical with the bacterial ring rot of Europe, according to the determination of the associated organism reported by Walter H. Burkholder. The disease, or a very similar one, is known to be present in this country in Maine, Florida, Pennsylvania, Wyoming, and Colorado, page 444. Its occurrence in Pennsylvania is reported by O. D. Burke, page 444; in Wyoming by R. J. Haskell, George H. Starr, and Glen Hartman, page 445. George H. Starr discusses the factor of seed transmission, page 446.

Verticillium wilt of Persian and honeydew melons is an important disease locally in California, according to B. A. Rudolph and W. C. Snyder, page 447.

T. C. Ryker contributes a report on the incidence of rice diseases in Louisiana in 1938, page 448.

Scab, Brook's spot, and phytophthora fruit rot are more prevalent than usual on apples in storage in Massachusetts, according to O. C. Boyd, page 449.

P. P. Pirone reports that rhododendrons are affected by the toxin secreted by black walnut roots, page 450. This article is quoted from the Nursery Disease Notes of the New Jersey Agricultural Experiment Station.

Potato late blight was severe in Pennsylvania according to O. D. Burke, page 452.

Thomas W. Turner reports that southern blight caused severe damage locally to peanuts in Eastern Virginia, page 452.

A brief literature note, a request, and a correction, page 452.

THE OCCURRENCE IN THE UNITED STATES OF THE TUBER RING ROT AND WILT OF THE POTATO

This is the title of an article in the September number of the American Potato Journal (vol. 15, no. 9, pp. 243-245. 1938), in which Walter H. Burkholder reports the isolation of a bacterium agreeing with the descriptions of Phytomonas sepedonica (Spieckermann & Kotthoff) Bergey et al. [Bacterium sepedonicum Spieckermann & Kotthoff] from potato tubers that had been grown in Maine. He states that the disease produced in plants inoculated with this organism is quite distinct from that caused by B. solanacearum E.F.S. This is not the first time that Bacterium sepedonicum has been mentioned in connection with the disease, but it is the first report of definite determination of the species in the United States. D. B. O. Savile and H. N. Racicot (Bacterial wilt and rot of potatoes, Sci. Agric. 17: 518-522. 1937) reported isolation of the causal organism, which, they stated, is very closely related to both Aplanobacter michiganense E.F.S., the cause of bacterial canker of tomato, and to B. sepedonicum, the cause of the bacterial ring rot of potato in Europe.

The disease with which this species is now definitely associated has been known in Canada for several years. Its presence there was first reported from Quebec in 1931 by B. Baribeau, in the Eleventh Annual Report of the Canadian Plant Disease Survey (p. 49). It has since been found in the Province of New Brunswick (Fourteenth Annual Report, 1934, p. 44). The disease has been of considerable importance in these Canadian provinces, according to reports of the Canadian Plant Disease Survey (15th, 1935, p. 36; 16th, 1936, p. 34-35; 17th, 1937, p. 35-36).

According to Reiner Bonde the disease was first observed in Maine in 1932 but its presence there was not reported until 1937 (A bacterial wilt and soft rot of the potato in Maine. Phytopath. 27: 106-108, 1937).

The disease has also been reported from Florida, by A. H. Eddins from the Hastings region (P.D.R. 21: 272, 1937; 22: 272, 1938), and by George D. Ruehle from Dade County (P.D.R. 22: 170, 1938). In the annual report to the Plant Disease Survey for 1937, C. D. Burke reported its appearance for the first time in Pennsylvania, in Lehigh County, and remarked that it was probably introduced with seed from Maine. In a recent letter, he writes

"The bacterial wilt of potatoes appeared on only two farms in Pennsylvania so far as has been reported. Damage was very slight in these cases. When potatoes were planted back in the fields in which the disease was rather severe last year, there was no indication of its recurrence. The cases that did appear seemed to be definitely traceable to seed carryover."

"A new potato disease in Colorado" reported by C. H. Metzger (Amer. Pot. Jour. 15: 255-230. Aug. 1938) may be the same as the one under discussion. According to Metzger the disease appeared in epidemic form in the Olathe district in Montrose County during the summer of 1937. It had not previously been observed in Colorado. Symptoms are reported as resembling those of bacterial wilt and brown rot caused by B. solanacearum, and also those of the wilt and tuber rot as described by Bonde and by Savile and Racicot.

In the following notes, R. J. Haskell, George H. Starr, and Glen Hartman, report the presence of the characteristic ring rot in Wyoming, and George H. Starr discusses the factor of seed transmission.

BACTERIAL RING ROT OF POTATO IN WYOMING

R. J. Haskell, George H. Starr, and Glen Hartman

On August 10, 1938, at Powell in northwestern Wyoming, the writers examined fields of a potato grower who had requested help with a potato disease problem. Powell is not in the seed producing area of the State. The first field visited showed about 25 percent of the plants with varying degrees of wilt, most of it in early stages. When split open the lower parts of the stems were not discolored. This wilt was different from Fusarium wilt. A large proportion of the tubers borne on wilted plants, perhaps 25 to 30 percent, almost invariably showed varying amounts of internal decay that was characteristic of ring-rot or what has been called "bacterial wilt and soft rot" in Maine and Florida. The only noticeable difference between the tuber symptoms and those as noted in Maine was the absence of external cracking and less of what appeared to be secondary decay. The seed for this Bliss Triumph field had come from a point near the Wyoming-Montana line two years ago. The grower had noted the same disease in his field last year. Other fields with seed from the same source this year showed the same disease but in much less amounts. The grower reported considerable field and shipping loss from the same disease last year.

Specimens were sent Miss Lillian C. Cash at the U. S. Horticultural Station, Beltsville, Maryland, who isolated the Gram-positive, non-motile Bacterium sepedonicum.

(Bureau of Plant Industry and Wyoming Agricultural Experiment Station).

WILT AND SOFT ROT OF POTATOES AND THE FACTOR OF SEED TRANSMISSION

George H. Starr

During the past season an irrigated field of Bliss Triumph potatoes in eastern Wyoming was found to be infected with the newly named disease, "bacterial wilt and soft rot", caused by Bacterium sepedonicum or at least by a disease very similar to it. This field was planted with a tuber-uniting planter in such a manner that the four seed pieces were planted adjacent in the row.

On September 9, when the plant and tuber symptoms were showing definitely, counts were made in different parts of the field to determine what portion of the plants in each unit was infected. A total of 315 diseased units were inspected. The field averaged about 10 percent of diseased plants. Before making the counts, numerous units were dug to correlate the plant symptoms with typical tuber symptoms. Of the 315 units observed, 64 or 20.3 percent showed symptoms on all four plants of the unit; 66 or 21.0 percent showed symptoms on three of the four plants; 75 or 23.8 percent showed symptoms in two of the four plants and 110 units or 34.9 percent showed symptoms in only one of the four plants of the unit. A later check-up would probably have revealed a higher percentage of infected plants per unit.

In addition to this particular lot of potatoes in the field, there was another lot from a different source, planted adjacent to these on one side of the field. There was not a single trace of "wilt and soft rot" found in these plants.

The entire field was broken up from virgin soil last spring so that there was no chance for carry over of the bacterial organism in the soil from previous potato crops. In addition, the seed was said to have been treated with corrosive sublimate previous to planting. However, this is apparently a case of wilt and soft rot as a result of the organism being transmitted through the seed tubers.

Moreover, "wilt and soft rot" has been found in several other irrigated fields planted with this same strain of potatoes, which supports the supposition that seed transmission is important as a method of spread of this disease.

(Wyoming Agricultural Experiment Station).

VERTICILLIUM WILT OF PERSIAN AND HONEYDEW MELONS

B. A. Rudolph and W. C. Snyder

In September, 1935, verticilliosis of watermelon was found in the Milpitas section of the San Francisco Bay region and reported in these pages[1]. This year a high percentage of Persian (Cucumis melo L.) and honeydew (C. melo L. var. inodorus Naud.) melons were found wilting in the same section. Cultures were made from the discolored vascular system of the roots and lower stems of specimens collected in August and Verticillium albo-atrum Reinke & Berth. recovered consistently. The fungus was also isolated from diseased honeydew melons grown in the Brentwood area, Contra Costa County.

The symptoms presented by the affected plants were typically those of verticillium wilt. The symptoms of fusarium wilt are similar, but that fungus was not isolated from the affected stelar tissue.

On the land involved near Milpitas, the verticillium wilt disease makes the culture of Citrullus vulgaris Schrad., Cucumis melo L. and C. melo var. inodorus Naud., impractical.

In 1931 Rudolph[2] reported verticilliosis of Cucumis melo L. (Persian and gold nugget varieties). In his report, a last minute entry, he attributed the disease merely to Verticillium sp. It was his intention to make the change to V. albo-atrum Reinke & Berth. in the galley proof, but this was overlooked. Subsequent to his report the disease in Persian melons has been reported frequently to him by growers who have suffered considerable losses as the result of it.

In 1934 Kendrick and Schroeder[3] reported observations in a field in which Cucumis melo L., and several of its varieties were growing side by side. Persian melons were severely affected with verticilliosis but neither the honeydew nor Hale's Best contracted the disease. In properly controlled inoculation experiments, however, they readily established the susceptibility of these varieties as well as the casaba and honeyball.

The present report constitutes the first of natural infection of the honeydew.

(Division of Plant Pathology, University of California).

1/ Rudolph, B. A., and W. C. Snyder. Verticillium from snapdragon, watermelon, celery, and cowpea. Plant Disease Reporter 20: 125-126. 1936.

2/ Rudolph, B. A. Verticillium hadromycosis. Hilgardia 5: 197-353. 1931.

3/ Kendrick, James B., and Floyd R. Schroeder. Inoculation tests with verticillium wilt of muskmelons. Phytopath. 24: 1250-1252. 1934.

RICE DISEASES IN LOUISIANA IN 1938

T. C. Ryker

Owing to unusually favorable weather conditions during March, the bulk of the crop was planted early and made unusually good early-season growth. The only set-back was due to freeze on April 6. However, only the leaves were killed back and the plants made quick recovery.

Cercospora oryzae leaf spotting was noted in two fields of Blue Rose near Crowley on June 9. This is the earliest that it has been recorded in Louisiana for commercial fields. However, heavy incidence of the disease did not occur until the middle to the last of August. Most fields of Blue Rose were almost completely browned by the fungus at the time of maturity. This leaf spot was much more prevalent in the southwest Prairie region than in the river sections.

Helminthosporium leaf spot (H. oryzae) was present in most fields of rice. However, only an occasional field showed a severe incidence of the disease. These latter fields were for the most part on the heavier soils. The disease is apparently becoming more prevalent.

Piricularia leaf spot (Piricularia oryzae) was observed to be prevalent in four fields. These fields had been planted to rice for the first time; two were of the variety Early Prolific and two were Blue Rose. The two fields of Early Prolific showed only moderate leaf infection when observed early in July. However, when observed again at maturity, August 8, they were showing severe neck rot. From 40 to 60 percent of the heads were affected. The Blue Rose on the other hand showed severe leaf infection during July, plants were killed in certain areas, followed by marked recovery during August and very little neck rot at the time of maturity, September 20. Two of the above fields were reclaimed marsh land. It has been the experience of the grower that in this type of land the disease is most serious the first season and becomes progressively less with each succeeding crop. Thus a high level of plant vigor would seem a prerequisite to a high incidence of the disease, a condition that does not exist in most commercial fields.

Following a rather prolonged wet period during the entire month of July, Rhizoctonia solani was observed to produce a rather serious disease condition in certain rice fields. The fungus was growing up over and killing the aerial portions of the plant in certain definite areas where the plant growth was dense. Diseased material was collected in four fields and in each instance a large sclerotial strain of R. solani was isolated. This fungus was apparently the same as that isolated occasionally from sheath spot, which is normally caused by R. oryzae.

This strain of Rhizoctonia solani is also apparently responsible for a common disease of Bermuda grass (Cynodon dactylon L. Pers.) occurring in Louisiana, following wet periods during the summer months. The plants are attacked in definite areas, and the leaves and leaf sheaths are killed. Other grassess occurring in these patches are similarly affected. It was also observed that sugarcane in contact with diseased Bermuda grass was affected. Symptoms induced were those of the "banded sclerotial disease" or "banded sheath spot" of sugarcane.

Stem rot, Sclerotium oryzae (Leptosphaeria salvinii), was observed in several fields but not to cause any serious loss.

(Louisiana Agricultural Experiment Station).

APPLE FRUIT DISEASES SINCE HARVEST IN MASSACHUSETTS

O. C. Boyd

Scab [Venturia inaequalis]: Scab in storage, particularly on McIntosh, is causing no small amount of concern generally--that is on crops that were harvested prior to the hurricane. A great deal of this infection was present as "pin-point" scab at harvest. The remainder has appeared in storage. The prolonged wet periods of July 7 to 11 and 18 to 25 favored fruit infections on unprotected crops that showed up during late August and during September respectively. Of course, the additional long rainy period of September 17 to 21, which terminated in the hurricane, would have constituted an extremely hazardous source of late-storage scab for such varieties as McIntosh and Delicious in particular, had the crops not yet harvested prior to the storm been fit to place in storage. What was considered unusually severe late season fruit scab in many crops not yet harvested when the hurricane struck, turned out to be slight damage compared with that caused by the storm.

Brook's Spot [Mycosphaerella pomi]: The unusual rainfall either in June or July or both greatly favored fruit infection by this disease in both apples and quinces. In the average season, it is most prevalent in the Plymouth-Bristol Counties section of the State. And this year, it is even more pronounced there than usual. Outstanding cases have been reported on Baldwin and Wagener, mostly in orchards where the later cover sprays were omitted.

Phytophthora Fruit Rot [P. cactorum]: This late season fruit disease is observed occasionally, either shortly before harvest or more commonly early in the storage season. Infections usually are restricted to fruits that hang near or actually touch the ground. This year, it is decidedly

more prevalent in storages than in most past seasons. The first reports concerned McIntosh apples that were harvested prior to the storm. Several additional reports concerned varieties such as Baldwin and Delicious harvested since the September storm.

(Massachusetts State College).

THE DETRIMENTAL EFFECT OF WALNUT TO RHODODENDRONS AND OTHER ORNAMENTALS

P. P. Pirone

The antagonistic action of walnuts (Juglans nigra L. and J. cinerea L.) to alfalfa, tomato, and potato, which resulted in the wilting and dying of these plants, was demonstrated by Massey (Phytopath. 15: 773-784. 1925). Several other investigators have observed similar toxicity by walnuts to apple trees and cinquefoil (Potentilla fruticosa L.).

Massey reported several interesting observations. He found the roots of affected plants always in close contact with walnut roots. Moreover, the toxic substance was not generally distributed in the soil around walnut trees, but was localized in the vicinity of walnut roots. He also found that walnut root-bark contains juglone or some similar substance. Tomato plants were injured when grown in a water culture containing this material.

An examination of the literature reveals no report of injury to ornamental plants growing in the vicinity of walnuts. An interesting case of poisoning to Rhododendron catawbiense by the black walnut (Juglans nigra) occurred in a North Jersey nursery recently.

The nurseryman cleared about one-sixth of an acre of a gradually sloping field near the summit of one of the North Jersey hills. The plot was well-drained and contained a rich loamy soil high in organic matter. Five black walnut trees ranging from 12 to 18 inches in diameter were allowed to remain on or around the edge of the cleared area.

Nine-year-old R. catawbiense were transplanted this spring into this area. The plants had been grown from seed sown in a bed located 150 feet from the nearest walnut tree. After a few years the seedlings were lined out adjacent to the seed bed. The plants were in vigorous condition this spring. They were moved to the cleared area early in May, each with a good ball of earth, and placed three feet apart. The plants continued to make good growth until the first week in July. At this time those growing in a circular area beneath the spread of the largest walnut

situated in the cleared area, suddenly wilted and died. The wilting and death then spread beyond the circular area beneath this and two other walnut trees until a major part of the plot was affected.

By late August, about two-thirds of the 750 rhododendrons in the plot had wilted or died. At this time the grower lifted those plants which were still unaffected and replanted them in a plot several hundred yards from any walnuts. All these plants have continued to grow and not one has wilted up to the present time.

Several freshly wilted plants were removed to the laboratory to determine whether wilt fungi were involved. All isolations proved sterile. Moreover, the symptoms were not typical of any of the known rhododendron diseases.

Careful observations were made to determine whether the injury to rhododendrons was correlated with the proximity to walnut roots. It appeared that injury to most of the rhododendrons occurred along the direction of the main walnut roots, and spread in fan-like areas from the main roots as they grew away from the trunk.

One healthy rhododendron was found about two feet from a walnut tree. The root system of this plant was situated in a space between two walnut roots, with no point of contact between the two root systems.

A similar case of walnut toxicity to other ornamentals was observed several years ago. A large black walnut (26 inches in diameter) stood along a fence row adjacent to a commercial perennial planting. Over a period of five years, the grower noticed that the plants growing in a semi-circle within a radius of thirty feet from the tree, were not thrifty. Among the plants which either died or made poor growth in this area were: Creeping Buttercup Ranunculus repens, Armeria vulgaris var. laucheana, Mother Thyme Thymus serpyllum, Crimson Thyme Thymus serpyllum coccineus, Wooly Thyme Thymus serpyllum lanuginosus, Lily-of-the-Valley Convallaria majalis, Carpet Bugle Ajuga reptans, and Forget-me-not Myosotis sp. Creeping Polemonium Polemonium reptans, and Plantainlily Hosta sp., appeared to be less susceptible to injury but showed poor vigor and some stunting.

Affected plants did not respond to generous fertilizer applications, and no symptoms of fungous parasites were visible. Moreover, the shading was not excessive. Suspicion was finally directed to the possible toxicity from walnut roots. This tree, together with most of the roots extending into the perennial beds, was removed.

No further trouble was experienced the following season or in any of the subsequent growing seasons. The rapidity with which the trouble disappeared indicated that the toxic substance did not remain in the soil very long and that living roots were necessary to produce toxic action.

The observations presented in this issue were called to the attention of several large nursery-and landscape-men who recall instances where Rhododendron maximum, hybrid rhododendrons and mountain laurel Kalmia latifolia, also showed unfavorable responses when planted in the vicinity of walnut trees.

(From New Jersey Agricultural Experiment Station Department of Plant Pathology Nursery Disease Notes 11: 13-16. Oct. 1938).

BRIEF NOTES ON PLANT DISEASES AND A REQUEST

POTATO LATE BLIGHT IN PENNSYLVANIA: Late blight [Phytophthora infestans] of potatoes was general throughout Pennsylvania and caused rather severe losses in the southeastern portion of the State. Losses throughout the State were higher than usual. In Pennsylvania potato yields are considerably lower than they were last year due almost entirely to the late blight epidemic. I would estimate a 10 percent reduction in potato yield this year due to this disease. (O. D. Burke, Nov. 19. Pennsylvania State College).

SOUTHERN BLIGHT ON PEANUTS IN EASTERN VIRGINIA: Southern blight (Sclerotium rolfsii) was severe on the Whipple Farm of the Hampton Institute, Elizabeth City County, causing a 15 percent reduction in yield. (Thomas W. Turner, October 23).

THE SPECIFICITY OF FUNGOUS ALLERGY: Upon noticing the list of references in the October 15 issue, on various molds associated with human disease, Dr. Emil F. Guba sent a reprint of a recent article on this subject, dealing particularly with specificity of reaction to species of Cladosporium. Four patients subject to asthma on exposure to spores of C. fulvum, growing in a commercial tomato greenhouse, reacted strongly to extracts of this species but showed little or no reaction to the other species of Cladosporium tested. (Rackemann, Francis M., Theron G. Randolph, and Emil F. Guba. The specificity of fungous allergy. Jour. Allergy 9: 447-453. July 1938).

A REQUEST: The Survey receives and reprints information from several mimeographed news letters on plant diseases issued by various Experiment Stations, including the "Crop Disease Notes" of the Massachusetts State College, prepared by Dr. O. C. Boyd, the "Weekly News Letter" issued by the Departments of Entomology and Plant Pathology of the New York State College of Agriculture, and the "Nursery Disease Notes" of the Department of Plant Pathology, New Jersey Agricultural Experiment Station.

The Survey would like to be put on the mailing list to receive similar news letters or circulars of information issued by other organizations, and to be given permission to use the reports in the Reporter.

A CORRECTION: In the article by A. E. Jenkins and E. A. Siegler in the preceding issue (Distribution of popcorn disease of mulberry, pages 435 to 438), the following errors should be corrected:

Page 436, under Florida, change Ancilla to Aucilla.

Page 436, under North Carolina, third line, the county is Columbus instead of Columbia.

Page 437, Abbeville County, South Carolina, was omitted on the map.